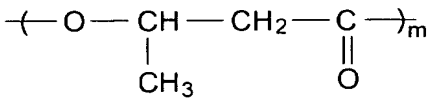
WHAT IS CLAIMED IS:

1. A PHA block copolymer having orientation-induced rubber-elasticity and temperature-sensitive shape memory effects, comprising:

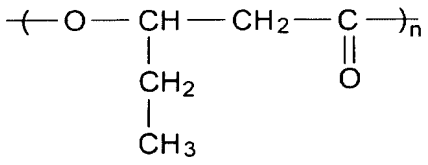
a plurality of 3-hydroxybutyrate (3HB) blocks of Formula 1 as a repeating unit:



(Formula 1)

wherein m is not less than 2; and

a plurality of 3-hydroxyvalerate (3HV) blocks of Formula 2 as a repeating unit:



(Formula 2)

wherein n is not less than 2.

2. The PHA block copolymer according to claim 1, wherein the block copolymer is heated to a temperature ranging from a melting point to thermal decomposition temperature thereof, thereby preparing a permanently deformed particular shape, and the permanently shaped material is subjected to constant external force at near room temperature for a predetermined period of time, thereby forming a shaped material having a temporary shape.

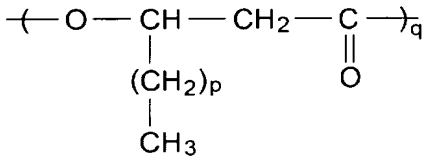
3. The PHA block copolymer according to claim 2, wherein the temporarily shaped material is rapidly recovered to its original state of the permanently shaped

material by heating the temporarily shaped material to a temperature ranging from a glass transition temperature to melting point thereof.

4. The PHA block copolymer according to claim 1, wherein the content of 3HV in the total monomers of the copolymer is within the range of 10 to 90 mol%.

5. The PHA block copolymer according to claim 1, wherein the molecular weight of the copolymer is approximately in the range of several tens of thousands to several millions.

6. The PHA block copolymer according to claim 1, wherein the copolymer further comprises not more than 70 mol% of a hydroxy acid repeating group of Formula 3, based on the total polymer:



(Formula 3)

wherein p and q are independently not less than 2.

7. A method for preparing a PHA block copolymer of Claim 1 by chemical synthesis, or biosynthesis using microorganisms.

8. The method according to claim 7, wherein the PHA block copolymer is prepared using saturated and/or unsaturated carboxylic acid as a carbon source and a *Pseudomonas* sp. HJ-2 strain (Accession No. KCTC 0406 BP).

9. The method according to claim 8, wherein the PHA block copolymer is prepared by culturing the *Pseudomonas* sp. HJ-2 strain with supply of heptanoic acid as a sole carbon source.

10. A blending or composite having temperature-sensitive shape memory effects, comprising a block copolymer of claim 1 or 6 and one or more third polymers.

11. A short-chain-length PHA synthetic gene of a *Pseudomonas* sp. HJ-2 strain capable of biosynthesizing a PHA block copolymer of Claim 1.

12. The short-chain-length PHA synthetic gene according to claim 11, wherein the gene includes a gene having a sequence as set forth in SEQ. ID. NO: 12.

13. The short-chain-length PHA synthetic gene according to claim 11, wherein the gene includes a gene having a sequence as set forth in SEQ. ID. NO: 13.

14. The short-chain-length PHA synthetic gene according to claim 11, wherein the gene includes a gene having a sequence as set forth in SEQ. ID. NO: 14.

15. A method for preparing a PHA block copolymer of Claim 1, by culturing a microorganism transformed with a short-chain-length PHA synthetic gene of Claim 11 or by cell-free protein synthesis using the same gene.

16. A method of using shape memory effects of a PHA block copolymer of Claim 1.

17. The method according to claim 16, wherein the PHA block copolymer is used as a medical material, a material for living necessaries, a fiber/fabric material or an industrial material.

18. The method according to claim 17, wherein the medical material is used in an angioplasty stent, an implant tube for the urethrae and the esophagi, a device for vascular anastomosis, a dental implant, or an orthodontic spring or wire.